

Does exchange rate depreciation improve balance of trade? : A case of Pakistan

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Roadmap

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Motivation

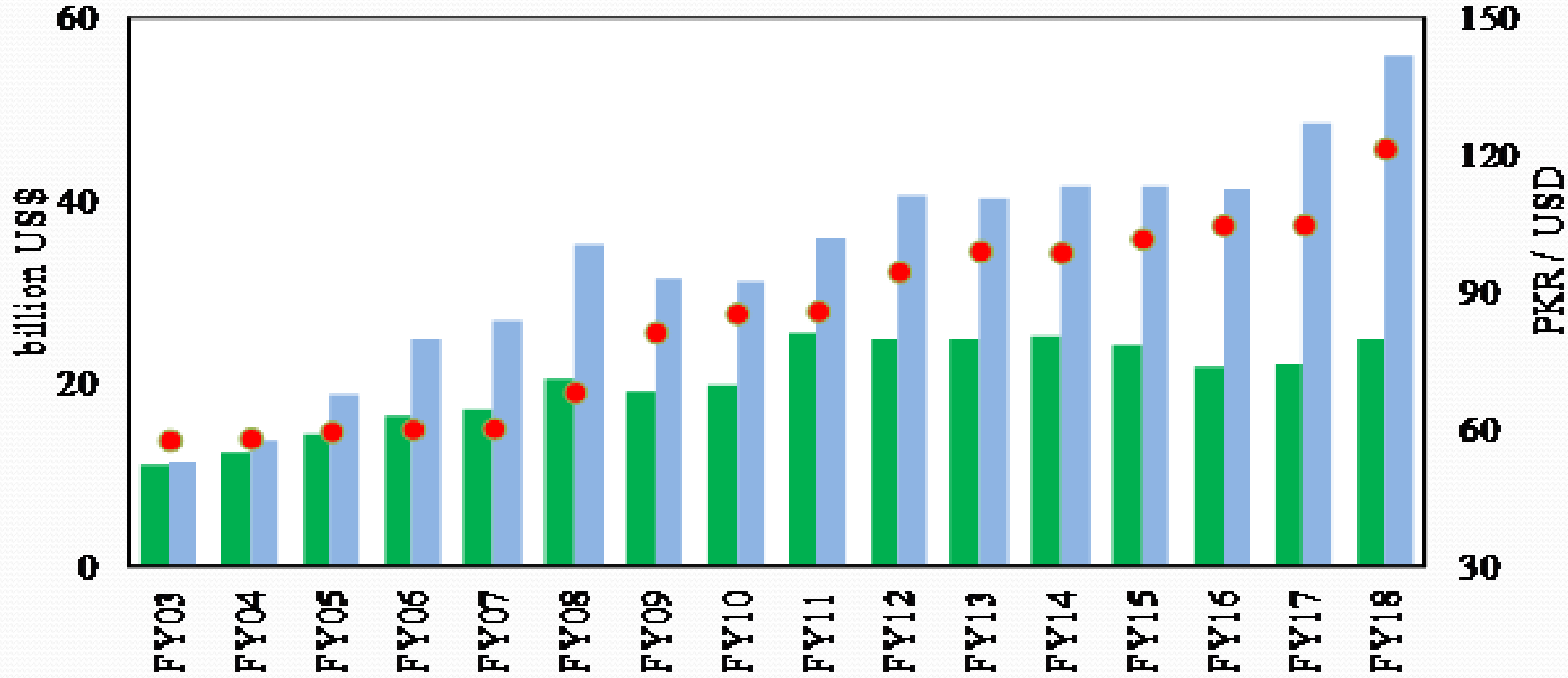
Facing rising import pressure and sharp increase in the current account deficit, Pakistan has recently depreciated its exchange rate by around 24 percent between December 2017 and December 2018, on the pretext that ongoing BOP crisis could be managed.

Despite, the situation remained challenging

- Import declined only marginally,
- Exports yet to show promising growth
- CAD remained at elevated level

Figure 1: Pakistan's trade and rupee-dollar parity

■ Exports ■ Imports ● PKR/USD (rhs)



Source: State Bank of Pakistan

What motivates exchange rate depreciation?

- Reduce imports as it become costlier
- Increase exports as domestic products become cheaper in importing foreign countries
- Foreign exchange reserves is likely to receives a boost due to positive net exports
- However, positive impact on trade boils down to elasticities. The expected benefit could realized only if the combined impact of elasticity of export and imports is greater than one.
- In literature, this is called **Marshall-Lerner condition**.

However, ER depreciation may lead to...

- Increase in the external debt and liabilities
- Increase in the external debt servicing
- decline in the net worth of the private businesses
- increase the cost of inputs
- increase in the inflationary pressure via exchange rate pass-through
- decline in the private wealth

Methodological challenges!

- Impact assessment of exchange rate depreciation on trade is challenging given the structural nature of the relationship between the key variables.
- It is not surprising that assessment remains ambiguous to date as some studies find positive impact of exchange rate depreciation and others getting none.
- Most of these studies are weak either due to their choice of specification or due to lack of understanding of the dynamics of these relationships.

Methodology

- Adopting the practice from literature, We augmented by designing four structural equations, namely;
 - Import Equation
 - Export Equation
 - Exchange rate Equation
 - Foreign Exchange Reserve Equation
- The key purpose is to control endogeneity and simultaneity, therefore technique adopted are,
 - 3 SLS
 - SUR
 - GMM

Import Equation...

$$\text{Imports} = \beta_0 + \beta_1 \text{Exchangerate} + \beta_2 \text{GDP_Pak} + \beta_3 \text{FXReserves} + \beta_4 \text{Concentration} + \beta_5 \text{Crudeprices} + \beta_6 \text{IMF} + \beta_7 \text{Nuke} + \beta_8 \text{Liberalization} + \varepsilon_{1t}$$

$\beta_1 < 0$, depreciation of real exchange rate (higher ER) should reduce imports;

$\beta_2 > 0$, increase in income should increase imports;

$\beta_3 > 0$, higher reserves should increase imports;

$\beta_4 > 0$, higher imports from China should increase imports;

$\beta_5 > 0$, higher crude oil price should increase imports;

$\beta_6 < 0$, introduction of IMF programs should lower imports;

$\beta_7 < 0$, Pakistan faced economic embargo after nuclear tests, it should have decreased the dependence on imports.

$\beta_8 > 0$, Financial liberalization may have increased imports.

Export Equation...

$$\begin{aligned} \text{Exports} = & \beta_9 + \beta_{10}\text{Exchange rate} + \beta_{11}\text{Imports} + \beta_{12}\text{World GDP} + \beta_{13}\text{IMF} \\ & + \beta_{14}\text{Nuke} + \beta_{15}\text{Liberalization} + \varepsilon_{2t} \end{aligned}$$

$\beta_{10} > 0$, Depreciation of real exchange rate makes Pakistani goods cheaper, it should increase exports.

$\beta_{11} > 0$, Increase in imported inputs should increase exports;

$\beta_{12} > 0$, Increase in World GDP should increase Pakistan's exports;

$\beta_{13} < 0$, Introduction of IMF programs may also constrain exports;

$\beta_{14} < 0$, Nuclear tests should have negative effect on exports;

$\beta_{15} > 0$, Financial liberalization should have positive effect on exports.

Exchange rate equation...

$$\text{Exchange rate} = \beta_{16} + \beta_{17}\text{Exports} + \beta_{18}\text{Imports} + \beta_{19}\text{Crude oil} + \beta_{20}\text{Remittances} + \beta_{21}\text{IMF} + \beta_{22}\text{Nuke} + \beta_{23}\text{Liberalization} + \varepsilon_{3t}$$

- $\beta_{17} < 0$, Higher exports appreciates real ER; should have negative impact;
- $\beta_{18} > 0$, Higher imports depreciates real ER; should have positive impact;
- $\beta_{19} > 0$, Increase crude price means higher import pressure; ER depreciates;
- $\beta_{20} < 0$, Increased in remittances appreciates ER; negatively related;
- $\beta_{21} > 0$, Introduction of IMF programs generally leads to depreciation of ER;
- $\beta_{22} > 0$, Nuclear tests may have created depreciation pressure on ER;
- $\beta_{23} = 0$, Financial liberalization should have no effect on real exchange rate.

FX Reserve Equation...

$$FX\ reserves = \beta_{24} + \beta_{25}Exchange\ rate + \beta_{26}Exports(-1) + \beta_{27}Imports\ (-1) + \beta_{28}Concentration + \beta_{29}Remittances + \beta_{30}IMF + \beta_{31}Nuke + \beta_{32}Liberalization + \varepsilon_4$$

$\beta_{25} > 0$, real exchange rate depreciation should have no impact on the FX reserves;

$\beta_{26} > 0$, Higher the value of exports last year, higher will be the FX reserves in CY;

$\beta_{27} < 0$, Higher the value of imports last year, lower will be the FX reserves in CY;

$\beta_{28} < 0$, Higher the imports from China, greater will be the decline in reserves;

$\beta_{29} > 0$, Higher the remittance inflows, higher will be the FX reserves;

$\beta_{30} > 0$, Introduction of IMF programs expected to support FX reserves;

$\beta_{31} > 0$, Nuclear tests may have forced to build FX reserves;

$\beta_{32} = 0$, Financial Liberalization may have no impact on the FX reserves;

Table 1 : Comparative estimates of import (volume) equation

	3SLS	SUR	GMM
Real Exchange rate	-0.5782* [0.000]	-0.5014* [0.000]	-0.9246* [0.014]
Pak GDP	2.5185* [0.000]	2.3807* [0.000]	2.7782* [0.000]
FX Reserves (-1)	0.0212 [0.509]	0.0108 [0.686]	-0.0965 [0.418]
Concentration	-0.2465* [0.003]	-0.2215* [0.000]	-0.6086* [0.026]
Crude Oil Prices	0.2676* [0.000]	0.2980* [0.000]	0.5681 [0.122]
IMF	-0.0022 [0.947]	-0.0063 [0.823]	-0.0176 [0.763]
Nuclear tests	-0.1709* [0.008]	0.1832* [0.000]	-0.1218* [0.368]
Liberalization	0.2918* [0.003]	0.2555* [0.000]	1.2177* [0.033]
Intercept	-0.8583 [0.232]	-0.5359 [0.251]	-0.8894 [0.662]

Table 2 : Comparative estimates of export (volume) equation

	3SLS	SUR	GMM
Real Exchange rate	0.2532*	0.3715*	0.2892*
	[0.000]	[0.000]	[0.000]
Import Volume	0.4889*	0.5865*	0.4495*
	[0.000]	[0.000]	[0.000]
World GDP	0.8504*	0.2776	0.9078**
	[0.027]	[0.317]	[0.096]
IMF	0.0291	0.0314	-0.0038
	[0.378]	[0.295]	[0.930]
Nuclear Explosion	-0.1700*	-0.1127**	-0.1866*
	[0.019]	[0.059]	[0.029]
Liberalization	0.0197	-0.0664	0.0069
	[0.809]	[0.337]	[0.971]
Intercept	-5.6335	-0.8136	-5.9691
	[0.083]	[0.729]	[0.206]

Table 3 : Comparative estimates of real exchange rate equation

	3SLS	SUR	GMM
Crude Oil Prices	-0.3177* [0.033]	-0.2378* [0.005]	-0.3816* [0.026]
Import Volume	-0.3722 [0.425]	-0.6055* [0.005]	-0.5015 [0.219]
Export Volume	1.5485** [0.000]	1.7023* [0.000]	1.7632* [0.000]
Remittances	-0.1351 [0.185]	-0.1134** [0.087]	-0.1126 [0.182]
IMF	-0.0182 [0.809]	-0.0319 [0.618]	0.0732 [0.215]
Nuclear Explosion	0.3354* [0.006]	0.3099* [0.001]	0.3859* [0.004]
Liberalization	0.1578* [0.391]	0.1933 [0.189]	-0.1016 [0.753]
Intercept	-4.8029* [0.000]	-4.4377* [0.000]	-5.3713* [0.000]

Table 4 : Comparative estimates of FX reserves equation

	3SLS	SUR	GMM
Real Exchange rate	0.3968 [0.386]	0.3348 [0.346]	-0.1455 [0.869]
Remittances	0.7828* [0.001]	0.7622* [0.000]	1.5120* [0.000]
Exports Volume (-1)	-0.4848 [0.599]	-0.4633 [0.538]	0.8516 [0.662]
Import Volume (-1)	-0.1921 [0.758]	-0.1821 [0.735]	-1.3813 [0.367]
Concentration	0.4191 [0.167]	0.4773* [0.066]	-0.4878 [0.423]
IMF	0.0979 [0.554]	0.0936 [0.526]	0.2859 [0.161]
Nuclear Explosion	0.7521 [0.021]*	0.7520* [0.007]	0.7975* [0.040]
Liberalization	0.5682 [0.201]	0.6167 [0.112]	1.3453 [0.342]
Intercept	4.7390* [0.034]	4.7119* [0.010]	1.0770 [0.826]

Table 5 : Comparative estimates of Marshal Lerner Condition

	Real Exchange rate	Nominal Exchange rate
3SLS	-0.1685 [0.312]	-0.9790 [0.244]
RUG	-0.1272 [0.248]	-1.1742 [0.010]
GMM	0.2138 [0.587]	-0.7004 [0.581]

Conclusion

- Depreciation of the real exchange rate leads to increase in exports and decrease in imports,
- Impact of the decrease in imports is stronger than increase in exports
- Moreover, the coefficient of imports significantly explains exports. Any depreciation in the real exchange rate though depresses imports, at the same time, is likely to have negative impact on the country's exports.
- Our findings suggests that Marshal-Lerner Condition is not holding.
- Pakistan needs to look beyond the exchange rate depreciation to arrest the recurring balance of payment crisis.

Caveats

- The result of the real exchange rate equation is not very encouraging, and probably, we need to dig further deeper.
- Our current results may have ignored a number of factors, including twenty years of terrorism which may have weakened the relationship between prices and export oriented industrial growth, and perhaps relocation in FDI.
- Moreover, our analyses have assumed that Pakistan's competitors doesn't follow the same ER policy when Pakistan depreciates its exchange rate
- We have ignored the Fiscal policy and interest rate policy as our objective was to limit our analysis to the trade only, instead of CAD.



Thank You!

Q&A